Why Are They Blind?

WILLIAM C. OWENS, M.D., ELSIE M. COX
and
MRS. FRANKLYN C. HOCHREITER

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William C. Owens, M.D., *Assistant Professor*

and

Elsie M. Cox, *Case Worker, Medical Social Service*

Wilmer Ophthalmological Institute, Johns Hopkins Hospital

Baltimore, Maryland

and

Mrs. Franklyn C. Hochreiter, *Former Chief of Psychiatric Social Work, Guidance Center*

New Orleans, Louisiana

STUDY of causes of blindness in Maryland, made under the direction of a planning committee representing local medical and social agencies.

THE Maryland Society for the Prevention of Blindness undertook a study to show the comparison of the incidence of blindness from treatable ocular conditions with the incidence of blindness from eye diseases for which at present there is no known effective treatment. This was done by gathering medical and social data on the persons whose blindness might have been delayed or prevented, with the hope of finding an answer to the important question of why they become blind. It was hoped also that such an analysis might disclose certain presently known needs in the program of blindness prevention and also indicate some new needs.

Procedure

Plans for the study were drawn up by a committee of ophthalmologists and social workers appointed by the Board of the Maryland Society. Later, the plans were worked out by a group of six trained social workers selected by the committee.

The ophthalmological resources asked to cooperate in the study were restricted to the City of Baltimore, since the results of such a study would probably be affected by the number, type, character and availability of eye resources within the community. Baltimore is particularly favored in this respect, having available to the general public excellent hospital facilities, clinics and a group of well-trained ophthalmologists.

The procedure of study included the examining of each person's complete medical record and, whenever indicated, the conferring with the one or more ophthalmologists to whom the patient was known. Whenever possible, patients were interviewed personally either in the clinic or in their own homes. In a few instances where the patient either lived out of town or had moved from the city before he could be interviewed, a social worker

* The authors acknowledge their indebtedness to Miss Ada Miller for the original impetus and planning of this investigation.

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in the new location was requested to conduct the interview.

Sources of Data

The definition of blindness adopted for the study was that used by the Federal Security Agency, "Visual acuity of 20/200 or less in the better eye with correcting glasses, or a field defect in which the peripheral field has contracted to such an extent that the widest diameter of visual field subtends an angular distance no greater than 20°."*

Three private ophthalmologists, the eye clinics at the Baltimore Eye, Ear and Throat Hospital, the Johns Hopkins Hospital, the University of Maryland Hospital, the Vocational Rehabilitation Bureau, and the Workshop for the Blind provided material for the study. From April 1, 1948 to October 1, 1948, each of these sources submitted the names of blind persons who came to them for service, usually consisting of medical care, vocational training or guidance. The applicants were new to the agency or newly qualified under the definition of blindness.

* "Causes of Blindness Among Recipients of Aid to the Blind," Federal Security Agency, 1947.

After eliminating duplications and those out-of-town patients whose early medical histories were not available, there remained to be studied 96 persons—51 white and 45 colored; 46 male and 50 female. Eleven persons were under 15 years of age; 33 were between 15 and 44; and 52 were 45 years of age, or over.

Age at Which Blindness Occurred

Exactly 25 per cent of the total, 24 persons, were blind at birth; 12 became blind between birth and 30 years of age; 14 between 30 and 45; and 30 between the ages of 45 and 64 years. Only 11 became blind when 65 or over. In 5 cases, the age at onset of blindness was not stated.

Since the blindness of 8 of these persons was due to two different ocular conditions, the committee, for the sake of accuracy, decided to call this a study of *104 cases of blindness*, rather than of 96 blind persons.

Table 1 shows the referral source of the 104 cases.

Site and Type of Infection—by Cause

The general picture of the causes of blindness for the group according to the site and type of affection indicates that glaucoma is by far the largest

TABLE 1. REFERRAL SOURCE OF 104 CASES OF BLINDNESS

Source	*Number*
TOTAL	104
Baltimore Eye, Ear and Throat Hospital	12
The Johns Hopkins Hospital, Wilmer Oph. Institute	49
Private Ophthalmologists	18
University of Maryland Hospital	6
Vocational Rehabilitation Bureau	7
Workshop for the Blind	12

TABLE 2. BLINDNESS WHICH COULD NOT HAVE BEEN PREVENTED
(Total, 39 Cases)

SITE AND TYPE OF AFFECTION	Total	CAUSE					
		Trauma, non-occup.	GENERAL DISEASES		*Prenatal*	*Unknown*	*Undetermined*
			Diabetes	*Other*			
TOTAL	39	3	11	1	8	12	4
Eyeball in General							
Albinism	3	..	..	..	3	..	..
Degenerative changes	1	..	..	..	..	..	1
Glaucoma, hemorrhagic	1	..	1	..	..	..	..
Myopia	2	..	..	..	..	2	..
Phthisis	2	2	..	..	..	..	..
Retrolental fibroplasia	7	..	..	..	..	7	..
Crystalline Lens							
Cataract	1	..	..	..	1	..	..
Choroid and Retina							
Macular degeneration	4	..	..	..	1	3	..
Retinitis pigmentosa	2	..	..	..	2	..	..
Retinopathy	10	..	10	..	..	..	..
Optic Nerve, Visual Pathways and Center							
Optic nerve atrophy	4	1	..	..	1	..	2
Retrobulbar neuritis	1	..	..	..	..	..	1
Vitreous							
Recurrent hemorrhages—Eales' disease	1	..	..	1	..	..	..

single cause of blindness, 26 cases constituting 25 per cent of the total. Optic nerve atrophy is the next largest, with 15 cases or 14.4 per cent of the total. There are 12 cases, 11.5 per cent, of retinopathy and 7 each, 6.7 per cent, of leukoma of cornea, detached retina and retrolental fibroplasia. The remaining 15 types of disease, only 29 per cent, occur from 1 to 4 times each.

Among the etiologic causes of the blindness, "unknown" appears most frequently: 39 times, or 37.5 per cent. All of the 7 retrolental fibroplasia cases and all but two of the 26 glaucoma cases are included in this group. In 13 cases, the cause is "undetermined" while "diabetes" accounts for 11, "syphilis" for 10, and "prenatal" for 9 cases.

Some Blindness Could Not Be Prevented

For the purpose of this study, the cases were divided into two groups; the first group (Table 2) consists of 39 (37.5 per cent of the total) instances of eye diseases for which there exists at present no known effective treatment. Blindness in these cases could not have been prevented, regardless of care or treatment.

Fortunately research is being conducted on most of the conditions from which these persons suffered, and it is hoped that in the future a similar study would show a smaller percentage of such cases.

Diabetic Retinopathy

Of special mention in this group are the 10 patients suffering from diabetic retinopathy. Eight of these patients were over 45 years of age and had had diabetes for some time. One other was 31 years of age, having had diabetes since childhood. In some instances the diabetes was not discovered until it had become well established, but these did not seem to fare any more poorly than the cases which were diagnosed early and treated competently.

These patients were rather discouraged about their blindness. One reason for this was probably the doctor's inability to give them any specific hope for improvement of their eye condition.

Dr. Edwin Dunphy, writing in THE SIGHT-SAVING REVIEW,* tells us that we are seeing more of these cases today because diabetic patients using insulin are living longer. The incidence of retinitis seems to be related to the duration of the diabetes rather than to its severity, Dr. Dunphy points out.

"Unfortunately," he says, "the control of the blood sugar level does not seem to have any effect in retarding the progress of the retinitis when it is once established. It is questionable, also, whether adequate treatment of the diabetes can prevent the onset of the retinitis in many cases. This does not mean that we should not make every effort to give the best possible treatment but it is discouraging to see retinitis develop in cases that have been under adequate treatment for years."

Much Blindness Might Have Been Prevented

The second group of 65 cases (Table 3) is the group with which this study is primarily concerned. These are the cases of blindness resulting from eye affections which ordinarily respond to treatment. In other words, these are the cases of blindness which, under different circumstances, might have been prevented altogether or at least delayed. In this group glaucoma accounts for 38 per cent of the total. Optic nerve atrophy is responsible for 17 per cent, and the other 12 conditions make up the balance of 45 per cent.

Table 4 attempts to classify the reasons why the treatment received by these particular 65 cases was not successful. These reasons are:

1. In 31 cases, or 47.6 per cent, the fault apparently is due to a lack of health education.
2. In 8 cases, or 12.3 per cent, the general practitioner did not administer proper treatment.

* Dunphy, Edwin B., M.D.: "How Does Middle Age Affect the Eyes?" THE SIGHT-SAVING REVIEW, XIX, 139–146, 1949.

TABLE 3. BLINDNESS WHICH MIGHT HAVE BEEN PREVENTED

(Total, 65 Cases)

SITE AND TYPE OF AFFECTION	Total	CAUSE									
		INFECT. DISEASES			TRAUMA						
		Ophthalmia neon.	*Syphilis*	*Other*	*Occup.*	*Non-occup.*	*Neoplasms*	*General Diseases*	*Prenatal*	*Unknown*	*Undetermined*
TOTAL	65	1	10	3	4	5	2	3	1	27	9
Eyeball in General											
Glaucoma	25	..	..	..	..	..	..	..	1	24	..
Myopic retinal detachment	1	..	..	..	..	..	..	..	..	1	..
Phthisis	1	1	..	..	..	..	..	..	..	..	..
Other affections of eyeball	1	..	..	..	..	..	1	..	..	..	..
Cornea											
Keratitis	2	..	1	..	..	..	..	..	..	..	1
Leukoma	7	..	..	2	3	2	..	..	..	..	..
Iris and Ciliary Body											
Iritis	1	..	..	..	..	..	..	1	..	..	..
Uveitis	4	..	..	..	..	..	..	..	..	..	4
Crystalline Lens											
Cataract	1	..	..	..	..	1	..	..	..	..	..
Choroid and Retina											
Choroiditis	2	..	..	..	..	..	..	..	..	..	2
Detached retina	6	..	..	..	1	2*	..	..	..	1	2
Retinopathy	2	..	..	..	..	..	..	1	..	1	..
Optic Nerve, Visual Pathways and Center											
Optic nerve atrophy	11	..	8	1	..	..	1	1	..	..	..
Optic neuritis	1	..	1	..	..	..	..	..	..	..	..

* 1 case following cataract extraction.

3. In 15 cases, or 23.1 per cent, blindness resulted apparently because of the peculiar characteristics of the individual case.
4. Eleven cases, or 16.9 per cent, fall into a miscellaneous group—chiefly accident cases.

Each of these causes will be discussed separately.

TABLE 4. WHY TREATMENT FAILED

SITE AND TYPE OF AFFECTION	Total	CAUSE OF UNSUCCESSFUL TREATMENT			
		Lack of health education	*Lack of proper treatment by general practitioner*	*Limitations of present medical research*	*Miscellaneous*
TOTAL	65	31	8	15	11
Eyeball in General					
Glaucoma	25	21	1	1	2
Myopic retinal detachment	1	..	..	1	..
Phthisis	1	1	..	..	..
Other affections of eyeball	1	..	1	..	..
Cornea					
Keratitis	2	1	..	1	..
Leukoma	7	1	..	..	6
Iris and Ciliary Body					
Iritis	1	..	..	1	..
Uveitis	4	2	..	2	..
Crystalline Lens					
Cataract	1	..	..	..	1
Choroid and Retina					
Choroiditis	2	..	..	2	..
Detached retina	6	1	..	3	2
Retinopathy	2	..	..	2	..
Optic Nerve, Visual Pathways and Center					
Optic nerve atrophy	11	3	6	2	..
Optic neuritis	1	1	..	..	..

Lack of Health Education of the Patient

Unsuccessful treatment of 31 cases seemed due to the patients' lack of knowledge regarding early symptoms of eye diseases and the importance of seeking and carrying out competent medical advice regarding them.

Eight patients lived in rural communities at the onset of their eye complaints, and competent treatment was not available. They waited until they were practically blind before coming to Baltimore for treatment. The reason for their coming here rather than going to some other city was

usually that they had relatives in Baltimore with whom they lived while attending a clinic. They gave as reasons for not coming earlier: (1) inability to afford the expense involved; (2) inability to leave their homes or work for the length of time required to obtain treatment; and (3) lack of realization that their eye condition was serious enough to seek help at such a distance.

These might be partial explanations for their delay, although an even larger group, 10, living right in Baltimore, delayed from 10 months to 16 years before seeking medical attention. Often aware of failing vision in one eye, it wasn't until the second eye was practically blind also that they did something about it.

Most of these patients were from the lower economic level and their attitudes toward blindness followed certain cultural patterns. Many regarded failing eyesight as one of the natural and inevitable consequences of old age which helped to secure their dependence upon relatives or welfare agencies. Others attributed failing eyesight to pregnancy, childbirth, and other physical conditions, or to periods of emotional strain such as illness or death in the family. They hopefully believed that when these conditions or situations cleared up their eyesight would improve.

Many with little or no education did not use their eyes for reading or other close work and so were quite unaware of early symptoms of failing eyesight. One man who worked as a porter at the coliseum first realized his need for eye care when he experienced difficulty in "setting up" the chairs in straight lines. Another man who stored tools on a WPA project found that he was no longer able to distinguish one tool from another.

Characteristic of this group was a lack of genuine interest in improving their vision. They accepted blindness quite passively and did not engage in any self-reproach for not having made more personal effort to avoid it.

Eighteen of this group consulted general practitioners or optometrists before going to an ophthalmologist or eye clinic. If their eye difficulty was associated with physical discomfort, they usually consulted their family doctor first. If their symptoms were confined to the eye, they sought glasses from an optometrist whom they were inclined to rate according to the fee he charged. They had no concept of differences in training between optometrists and ophthalmologists. Some of the group considered eye clinics inferior because in the clinics they had to wait their turn and the fee was not so high as that charged by the optometrists whom they referred to as "specialists."

Those patients going directly to a clinic were usually persons familiar with the clinic, either through previous personal contact or through information from relatives or friends who had received clinic service.

Treatment, once recommended, was usually not carried out with consistency, and clinic visits were considered inconvenient. This might be explained partially by their lack of drive for good eyesight. However, we must recognize the fact that the older patients, and there were 19 over 60 years of age, often justifiably found clinic attendance a real burden. Many of them had no relatives to bring them, no money for taxi fare, and were too

infirm and handicapped by poor vision to come alone.

Glaucoma Patients.—Of the 31 cases in which lack of health information was a factor, 21 were glaucoma patients. All of these seemed to follow pretty much the same pattern of: (1) ignoring or not recognizing early symptoms; (2) delaying application for treatment until sight in both eyes was practically gone; (3) shopping around among clinics and optometrists for the treatment; (4) not understanding the seriousness of glaucoma, once this diagnosis had been established; (5) not following treatment recommendations consistently.

With glaucoma patients, the delay in seeking help is due partially to the fact that at times their eyesight is better than at others. This suggests to them that their failing vision might be temporary, and they wait to see what tomorrow will bring. The pattern is repeated, and months and sometimes years slip by without treatment. Most of these patients seem to have a very meager understanding of the nature of the disease and the function of the drops in treatment. Thus, many of them take the drops irregularly or discontinue them altogether when they do not observe any dramatic improvement of vision.

Mr. T. is fairly typical of this group. In 1945, while unloading railroad cars, he became aware of failing vision. Because he was unable to continue his employment, he went to an eye clinic, and drops were prescribed. After a few months he discontinued both the drops and his clinic attendance. In 1947, his eyesight growing steadily worse, he consulted an optometrist who suggested he go to a hospital clinic. Instead of following this suggestion, Mr. T. went to another optometrist where he received a pair of glasses and a bill for $21.00. A few months later, an insurance collector calling at the home suggested he go to another eye clinic. Mr. T. finally did so, only to find that he was "blind."

Mrs. B. was one of the seven glaucoma patients who lived in rural areas during the early stages of their condition. She first noticed failing vision when she was in her early forties. The letters ran together when she read. She thought this condition was due to her pregnancy and so paid no attention to it. A few years later, when it persisted, she thought it was caused by her "change of life." Her eyesight continued to grow worse and she finally obtained glasses from an optometrist. They did not help, so she consulted several other optometrists. One of them told her that her "eye nerves were bad." At the age of 55 she moved to the home of her niece in Baltimore in order to obtain treatment at a clinic. It was a little late for this, however, since at the clinic she was found to have no light perception in either eye.

Affections Caused by Prenatal Syphilis.—Three cases of optic atrophy and one each of optic neuritis, leukoma, and interstitial keratitis, were diagnosed as resulting from prenatal syphilis. Since these patients ranged in age from 16 to 32 at the time of this study, it was impossible to establish any accurate details of the mothers' maternity care. Although in two of these cases the parents did everything possible to obtain effective treatment for the children's eye condition at an early age, the harm had already been done before the children's birth, through lack of prenatal care and proper health education.

Lack of Proper Treatment by the General Practitioner

In 8 of the 65 cases of preventable blindness, the onset seems to have been hastened by the type of treatment received from general practitioners or in general medical clinics.

Mrs. B., who had both glaucoma and hypertension, suffered three acute glaucoma attacks but was treated on each occasion by the family physician for her hypertension only. When the eye symptoms were finally recognized, the glaucoma had progressed to such a degree that she was "economically blind."

Mrs. S. was advised by her family physician that she was suffering from a mental illness. A couple of months later, when the symptoms persisted, a neurologist found her to have a brain tumor which was causing optic atrophy.

Five cases of optic atrophy followed syphilitic infection. In each case the patient had been treated for syphilis by a general practitioner, in a clinic, or while in the armed services. Three of them had been treated by several sources. All claimed that they had been left with the impression that the syphilis was cured, and none had received any warning regarding the possibility of an eye involvement.

Mr. C., totally blind at 39, received treatment for syphilis in the State Penitentiary in 1934, and again a few years later, while in the army. He thought this treatment had been adequate. He had never heard of blindness resulting from syphilis. Now he feels depressed and confused, saying, "Medicine has let me down."

Limitations of Present Medical Research

Fifteen of the 65 cases of preventable blindness had eye affections for which there is effective known treatment at present, but they did not respond to treatment. In most of these cases, excellent ophthalmological care was received and the patient was cooperative and sincerely interested in improving his vision. The only explanation for these cases is that medical science has not progressed sufficiently to cure all variations of the diseases which ordinarily respond to treatment.

Of these 15, there were one each who had glaucoma, keratitis, and iritis; two cases of uveitis, choroiditis, retinopathy, and optic nerve atrophy; and 4 cases of detached retina. The causes of these conditions were listed as: one each of arteriosclerosis, hypertension, meningitis, sarcoidosis; two prenatal; 4 undetermined; and 4 unknown.

Miscellaneous Causes for Failure

In this group of 11 cases of blindness from eye conditions for which there is known treatment, we have included 1 glaucoma patient unable to accept treatment because of mental illness and the 8 accident cases. Three of the accidents resulting in damage to the cornea and one causing a detached retina were industrial.

Mr. H. was employed by a piano company in 1916, when a wire piano string flew into his left eye. There were no guards to prevent such accidents at the time but they were installed shortly after this accident occurred.

Mrs. S. lost the sight of both eyes when a tray of torpedoes exploded in the fireworks factory where she

worked. There were no accident prevention measures employed in the shop. This accident occurred several years ago and the shop is no longer operating.

Mr. G., twenty years ago, lived on the island of Trinidad. He was employed as an electrician, rewinding armatures for motor cars. While clipping a pipe, a piece of steel penetrated his eye. There was no magnet on the island to remove the steel and infection set in.

In 1934, Mr. P. was mining coal on a hill in West Virginia. Some pieces broke off and struck him about the face and head, causing detachment of the retina in his right eye. He received first aid from a general practitioner and was not aware of any impairment of sight. Two weeks later he noticed spots floating in front of his right eye. This time, the general practitioner referred him to an optometrist in a nearby town who said that the sight had been irreparably lost and no treatment was indicated.

Of the remaining 4 accidents, 2 occurred during play, 1 during household activity, and 1 as the result of a traffic accident.

A young boy of 10 suffered extensive corneal damage when he was struck in the left eye. Three years later he was struck in the right eye, again suffering severe corneal damage.

A scissors penetrated Mr. M's left eye causing retinal detachment and formation of a cataract.

The last case of accident, causing detached retina in both eyes, resulted from the overturning of a truck in which Mr. T. was a passenger. He received treatment in a hospital in Washington; was dismissed in 3 days; then admitted 10 days later to a general hospital in Baltimore where attempts were made to attach both retinas. This surgical procedure was only partially successful, however, since Mr. T's eyesight with correction qualified him as blind.

Conclusions

Of 104 cases of blindness, there were 39 in which blindness resulted from eye conditions for which there is no known effective treatment at the present time. Another 15 cases did not respond to the treatment that is usually effective for their disease. This makes a total of 54 or slightly over one half of the cases which are due to the present limitations of medical science. Such a situation emphasized the continuing need for research to discover some effective treatment for these particular eye diseases. This responsibility, of course, lies primarily with the medical profession.

In regard to the remaining 50 cases of blindness, the study shows that there are definite responsibilities for the nonmedical group in preventing blindness.

More Eye Health Education of the Public Needed.—This study revealed that 38 persons became blind because they did one or more of the following:

1. Failed to recognize early eye symptoms.
2. Delayed too long in seeking treatment because of failure to understand the importance of early, accurate diagnosis of eye symptoms.
3. Minimized the importance of failing eyesight, not realizing that it might be a symptom of any of several serious eye diseases which cannot be treated with glasses.
4. Sought care first from an optome-

trist or general practitioner who did not administer proper treatment.

Need for Strengthening Patient-Clinic Relationships.—Many of the patients in this study who were treated in clinics were irregular in their attendance. Also, they shopped among the several clinics in the city, thus duplicating valuable professional services.

The apparent reasons for this behavior were the patient's: (1) lack of understanding and acceptance of the diagnosis of his eye condition; (2) lack of understanding of the purpose of the clinic's treatment; and (3) resistance toward the general limitations of clinic service, such as long waiting periods, change of doctors, etc.

Need for Public Education Regarding Accident Prevention.—In 12 cases, blindness was due to trauma so severe that vision was lost. Of these, 4 cases were occupational and 8 nonoccupational accidents.

Need for Further Study to Learn Why "Preventable Blindness" Occurs.—The large group of glaucoma patients found in this study challenges further inquiry. What can we find out about their social and economic background which might have some bearing upon their failure to seek an early, competent diagnosis of their eye condition? Why do so many of them fail to cooperate faithfully with their treatment?

Another problem for study is that of persons residing in rural areas who do not obtain a competent diagnosis of their eye condition until it is too late for effective treatment. How many of these persons are there right here in Maryland; right here in the vicinity of Baltimore? It would be interesting to make a record of all such persons applying to our Baltimore clinics for eye treatment over a certain period of time and to obtain on each the social data necessary to estimate the need for specialized eye care in rural areas.

Thus, in seeking an answer to "Why Are They Blind?" our study reveals needs and new problems so compelling and challenging that they demand to become a part of our planning for years ahead.

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